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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,891	07/16/2003	Masataka Ito	273855US90	1485
22850 7590 06/04/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER PEACE, RHONDA S	
			ART UNIT 2874	PAPER NUMBER
			NOTIFICATION DATE 06/04/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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**Office Action Summary**

Application No.

10/621,891

Applicant(s)

ITO ET AL.

Examiner

Rhonda S. Peace

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2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

Applicant's amendment to the specification, filed 3/6/2007, is sufficient to overcome the objection set forth in the Office Action mailed 9/6/2006.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

*Claims 1-7, 9-13, 16-21, 24-32, 35-40, and 44-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakii et al (US 5764833) in view of Nakanishi et al (US 6655856).*

*Regarding claims 1, 10, and 44, Kakii et al discloses an optoelectronic communication module comprising the following:*

- Optical fibers **1** terminating in facets on an end face of an optical block **F** (column 12 lines 6-18, hereafter indicated in the form 12:6-18, Fig 20).
- A module **31** joined to the end face of block **F**, where the module **31** contains a laser diode array **33** (12:6-18, Fig 20).

With regard to the module 31, Kakii et al does not disclose in any lengthy detail the specific construction of the module, and instead describes the module as conventional. Therefore, Kakii et al does not disclose bonding the laser to the submount, the inclusion of driver circuits, and the inclusion of a cap that encloses the laser diode array and fiber facets.

*Continuing with claims 1, 10, and 44, Nakanishi et al discloses an optical module having a laser diode **30** and associated driver circuits **31** bonded to a submount **27** that is topped by cap **37** (9:1-15 and 24-31, Fig 3). The cap 37 is detachable from the submount 27 prior to the curing of resin 36 (5:7-11). In Figures 10-17, Nakanishi et al shows various embodiments of the submount **27** in combination with the cap **37**. As it*

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has been held that forming in one piece an article formerly formed in two pieces (*Howard v. Detroit Stove Works*, 150 U.S. 164 (1893)), as well as forming a formerly integral structure in various elements (*Nerwin v. Erlichman*, 168 USPQ 177, 179), involves only routine skill in the art and is within one of ordinary skill in the art, it becomes apparent that a wide range of variations for the fitting of a cap to a submount is obvious in view of Nakanishi et al. For example, an obvious variant of the embodiment shown in Figure 11 of Nakanishi et al would be an encasement where submount 75 does not include the enclosing side walls 25 (as is seen in Figure 13), and the enclosing side walls 25 of Figure 14 are made integral with the cap 37, thereby forming a flat submount having a U-shaped cap fitted thereon. This orientation would allow the cap 37, with sidewalls 25, to contact and be fixed to both the fiber 34, as well as the submount portion 75, and fully enclose the fiber's (34) end face and the laser diode 30. Note that the cap 37 and sidewalls 25 may be considered a "spacer."

*In conclusion with respect to claims 1, 10, and 44*, it would have been obvious to one of ordinary skill in the art to combine module encasing structure (or any obvious variant thereof) with the overall coupling structure taught by Kakii et al, as the module of Nakanishi et al provides an excellent seal against environmental contaminants, allows the use of silicone resin in a more accurate fashion, which is advantageous, as the proper use of silicone resin allows for the elimination of previously required elements, such as lenses, and therefore allows the module to be produced at a minimized size and reduced cost (Nakanishi et al 1:64-67, 2:1-15, 3:4-15, 4:30-37, 5:7-26).

*With respect to claims 2, 5-7, 9, 13, 16, 17, 45, 46 and 50, Kakii et al, in view of Nakanishi et al, discloses the optical system as described above. To further elaborate on the teachings of Nakanishi et al, resins 35 and 36 are used to fill the enclosure formed by the submount and cap, and provide to bond the fiber array, cap, and submount to one another, thereby hermetically sealing the enclosure. The laser 30 and fiber facets are encapsulated by silicone resin 30, which is substantially transparent to light waves passing between the fiber and the laser. Resin 36 is used to provide a hard outer covering to resin 35, and bonds the fiber to the submount and cap (5:7-11, 9:24-31, Fig 3).*

*Concerning claims 3, 4, 11, 12, 47-49, and 51-53, Kakii et al, in view of Nakanishi et al, discloses the optical system as described above. As previously discussed, several variations of the embodiments shown in Figures 10-17 of Nakanishi et al are considered obvious to one of ordinary skill in the art. For example and referring to Figure 15 of Nakanishi et al, the submount may contain the plate 75 and a portion of the left-most side wall 25, while the cap contains upper plate 37, a portion of the left-most side wall 25, as well as all of right-most the side wall 25 as a unitary cap piece. Moreover, sidewalls 25 may be separated from the submount 75.*

*With regard to claims 18, 20, 25, 31, and 54, Kakii et al, in view of Nakanishi et al disclose the optical system as disclosed above, and further disclose a method of forming such an optical system comprising:*

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- Providing an optical fiber block **F** supporting a plurality of fibers **1** each terminating in a face on an end face of the block **F** (Kakii et al: 12:6-18, Fig 20).
- Bonding block **F** to an optical module **M** along the fiber facet (Kakii et al 12:6-18, Fig 20).

As discussed above, it would be obvious to one of ordinary skill in the art to use the module of Nakanishi et al in place of the module **M** shown in Figure 20.

Correspondingly, Nakanishi et al specifically discloses the method of forming the following:

- Providing a submount **75** (7:38-43, Fig 15).
- Bonding laser diode **30** to the submount **75** (Fig 5, 9:12-13).
- Affixing a containment dam having sidewall portions **25** and cap portion **37** to submount **75** for defining a fluid containment enclosure that encompasses the laser **30** and the fiber's end face. A portion of the containment dam is interposed between said submount **75** and the fiber **34** (9:24-31 and 58-63, Fig 3).
- Optically aligning the submount **37**, containment dam **25** and **37**, and laser **30** with a fiber **34** (Fig 3).
- Applying a liquid resin **35** and **36** to encapsulate the laser **30** (9:24-32, Fig 3), and thereby bond the containment dam and submount to the fiber **34**.

*Pertaining to claims 21, 24, 29, 32, 35-40, and 55-60, as it has been held that forming in one piece an article formerly formed in two pieces (Howard v. Detroit Stove Works, 150 U.S. 164 (1893)), as well as forming a formerly integral structure in various elements (Nerwin v. Erlichman, 168 USPQ 177, 179), involves only routine skill in the art and is within one of ordinary skill in the art, it becomes apparent that a wide range of variations for the fitting of a cap to a submount is obvious in view of Nakanishi et al. For example, an obvious variants of the module disclosed by Nakanishi et al would include the following (which are explained with reference to Figure 15):*

- A system having a submount **75**, and a cap mounted thereon comprising three sidewalls **25** and a top portion **37**. As Nakanishi et al discloses the cap **37** may be bonded to the structure of Figure 15 (11:35), it would be obvious to one of ordinary skill in the art to bond the modified cap structure explained herein to its underlying submount.
- A system having a submount **75** and a cap mounted thereon having a separate top portion **37** and three side walls **25**, where the open end of the resulting structure is fitted with the fiber block, where the side walls are assembled first with the underlying submount (Fig 14), and the top portion **37** is then affixed atop the side walls **25** (Fig 15).
- A system having a submount **75** with side walls **25** extending upward to a point where the fiber **34** is introduced, and a cap structure having a top portion **37** and side wall portions **25** extending downward from the top



portion **37**, such that the side wall **25** of the submount **75** is adhered to the end face of the fiber block.

- A system as discussed immediately above where the top portion **37** is separate from cap structure, where the top portion **37** is affixed to the sidewalls **25** to create the containment dam.
- A system where the side wall **25** closest to the fiber serves as a spacer separate from the submount **75**, such that one surface of the spacer is bonded to the submount **75**, and the opposing side is bonded to the fiber block.
- A system where the sidewalls **75**, base **75**, and cap **37** forms a closed perimeter spacer placed around submount **26**.

*Concerning claims 19, 26-28, and 30, Kakii et al, in view of Nakanishi et al,* disclose the optical system and associated method as described above. As before, resins **35** and **36** are used to fill the enclosure formed by the submount and cap, and provide to bond the fiber array, cap, and submount to one another, thereby hermetically sealing the enclosure. The laser **30** and fiber facets are encapsulated by silicone resin **30**, which is substantially transparent to light waves passing between the fiber and the laser. Resin **36** is used to provide a hard outer covering to resin **35**, and bonds the fiber to the submount and cap (5:7-11, 9:24-31, Fig 3). Moreover, the alignment process requires the fixing of the submount to the fiber block, as the resin is poured upon placement of the fiber relative to the laser, and it is the pouring of the resin that constitutes the alignment process (4:66-67, 5:1-6).

*Claims 8, 14, 15, 22, 23, 33, 34, 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakii et al (US 5764833), in further view of Nakanishi et al (US 6655856), in further view of Porter et al (US 2004/0228601).*

*Pertaining to claims 8, 14, 15, 22, 23, 33, 34, 41-43, Kakii et al, in view of Nakanishi et al, discloses the optical system and associated method as described above. However, neither discloses an injection hole for injecting the resin into the chamber, thereby allowing the placement of resin to be the last step in the manufacturing process. Porter et al discloses a hole 36 for injecting resin into a chamber 37 (paragraph 0100, Fig 1). It would have been obvious to one of ordinary skill in the art to combine the teachings cited above with those of Porter et al, as this allows the precise placement of the resin within the chamber (Porter et al: 0100). It would be obvious to one of ordinary skill in the art to place the hole through the cap of the module or through a sidewall of the module, as this provides the easiest access for the user to administer the liquid resin via needle.*

### ***Response to Arguments***

Applicant's arguments, see page 13, filed 3/6/2007, with respect to the rejection of claims 4, 8, 32, 38, and 55 under 35 U.S.C. §112, second paragraph, have been fully considered and are persuasive. The rejection of claims 4, 8, 32, 38, and 55 under 35 U.S.C. §112, second paragraph, has been withdrawn.

Applicant's arguments filed 3/6/2007, with respect to the art rejection made in the previous Office Action mailed 9/6/2006, have been fully considered but they are not persuasive.

With regard to claims 1 and 10, Applicant argues Nakanishi et al does not disclose neither "a cap disposed on said submount and detachably adjoining said end face of said optical fiber block such that said cap encloses said edge emitting laser diode array and said fiber facets therein" as recited in claim 1, nor "a spacer interposed between said submount and said end face such that said spacer encloses said diode array and said fiber facets." Furthermore, Applicant states the above rejection is improper, as Nakanishi et al would not allow further movement or alignment of the optical fiber and the LED once mounted upon the substrate. The Examiner respectfully disagrees.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Nakanishi et al would not allow further movement or alignment of the optical fiber and the LED once mounted upon the substrate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). None of the above rejected claims include a limitation which requires the apparatus to be constructed such that the optical fiber and LED can be realigned once mounted upon the substrate.

Additionally, with regard to claims 1 and 10, Applicant argues neither Porter et al nor Kakii et al disclose "a cap disposed on said submount and detachably adjoining said end face of said optical fiber block such that said cap encloses said edge emitting laser diode array and said fiber facets therein" nor "a spacer interposed between said submount and said end face such that said spacer encloses said diode array and said fiber facets." The Examiner agrees, as these features are disclosed by Nakanishi et al, as described in the rejection above.

Moreover, Applicant asserts with regard to claims 18, 25, 44, and 54, the prior art does not disclose "providing a cap configured to be disposed on said submount and adjoin to said end face of said optical fiber block such that said cap encloses said laser diode array and said fiber facet array therein," "providing a containment dam configured to be interposed between said submount and said end face such that said containment dam encloses said diode array and said fiber facets," "a chamber forming device configured to form a chamber with said submount and said end face of said block such that said chamber forming device encloses said diode array and said facets," "providing a containment dam configured to be disposed on said submount and adjoin said end face of said optical fiber block such that said containment dam encloses said edge emitting laser diode array and said fiber facets therein, said containment dam having a bottom surface and at least one side surface," or the reasons cited above with respect to claims 1 and 10. The Examiner respectfully disagrees for the reasons cited above.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

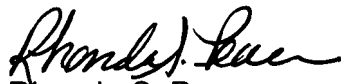
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tada (US 5684902) discloses a semiconducting laser module, and Miura et al (US 5966448) discloses an optical module for connecting an optical element and an optical fiber.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda S. Peace whose telephone number is (571) 272-8580. The examiner can normally be reached on M-F (8-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272- 2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Rhonda S. Peace  
Examiner  
Art Unit 2874

  
MICHELLE CONNELLY-CUSHWA  
PRIMARY EXAMINER  
5/29/07